# _LITfinalLOGO

# SUMMER EXAMINATIONS 2013

**Thursday, 16th May 2013, 14.30 p.m. – 17.30 p.m.**

**KSDEV\_8\_Y2**

**Course:** Bachelor of Science (Hons) in Software Development

**Year:** Two

**Subject:** Data Driven Applications

**Time Allowed:** 3 Hours

**Instructions: 1. ANSWER FOUR QUESTIONS AS FOLLOWS**

* ANSWER Question One (1) in PART A
* ANSWER Question Two OR Question Three in PART A
* ANSWER Question Four AND Five in PART B

**2.** Indicate clearly on the front of the answer book which

questions have been attempted.

**Additional Attachments or Exam Material to accompany this paper:**

### Candidates are permitted to access their instance of Microsoft SQL Server which is required to complete the practical questions.

**Internal Examiners: External Examiners:**

Mr. Gerry Guinane Mr. Paul Powell

**PART A: Written answers required**

**Q1. DATABASE SYSTEMS TERMINOLOGY**

a) The following definition of a database is given by C.J. Date - “A database is a persistent collection of related data supporting several different applications within an enterprise or organisation.” Explain clearly, with the use of examples, what is meant by this definition.

**(5 marks)**

b) What is ODBC? What is its purpose? What are the advantages and disadvantages of using a standardised API versus a vendor specific one? **(5 marks)**

c) In the context of web applications which provide dynamic page content – distinguish between client side scripting versus server side scripting. Use a suitable diagram to illustrate your answer. **(5 marks)**

d) Clearly distinguish between the following relational database terms – Primary Key, Foreign Key, Composite Primary Key and Referential Integrity. Provide examples of each to illustrate your answer.

**(5 marks)**

**(Total 20 Marks)**

**Q2. MySQL and E/R MODELLING**

Practical tasks:

* Task 1: Download the database provided in the Exam Drive Q2 folder: ‘itschool.sql’
* Task 2: Restore the ‘itschool’ database to MySQL

Written answers: With reference to the database you have restored answer the following questions in your answerbook:

a) Draw a fully labelled E/R model (diagram) of the database ITSCHOOL that you have just restored. Show all entities, their attributes and cardinality of relationships.  **(9 marks)**

b) What are the Foreign Key (FK) relationships in the database? For each FK identify the name of the FK relationship and the two tables and their attributes (column names) linked by the FK relationship. **(6 marks)**

c) Write down SQL Queries to answer the following questions:

(i) What module(s) does John Smith teach? The query result should

show Lecturers first and lastname and the module code and title of

modules he teaches.

(ii) Which students attended John Smith’s classes in this module and

what were their grades? The query result should show moduleID,

module title, student ID, student last name and grade for any

module that John Smith teaches.

**(12 marks)**

d) If the following data is entered in the results table an error message appears: StudID: K01090431

ModID: EN101

Grade: 45

Explain clearly why this error message occurs. **(3 marks)**

**(Total 30 Marks)**

**Q3. Entity-Relationship Modelling**

Note: Your SQL Server instance is listed in the “ServerLogins” document in the Q3 folder.

Before answering this question carry out the following tasks:

1. Create a new database “Q3COLLEGEDB” on your instance of Microsoft SQL Server.

2. Locate the T-SQL script “SQLQueryCOLLEGE.sql” in the Q3 folder on your exam drive.

3. Execute the “SQLQueryCOLLEGE.sql” script in your instance of Microsoft SQL Server.

a) In the context of Entity-Relationship (E/R) modelling - What is meant by the terms ‘Entity’ and ‘Relationship’? Give examples in reference to the Q3COLLEGEDB database. **(5 marks)**

b) What is E/R modelling? What is its objective?  **(5 marks)**

c) Show,using appropriate examples, the E/R modelling diagrammatic conventions for the following relationship types : One to One, One to Many and Many to Many. What table design rules may be applied for each of these E/R relationship types? Use examples to support your answer.  **(10 marks)**

d) Draw an E/R diagram for the Q3COLLEGEDB Database. You may

assume the following enterprise rules:

* A Student may be enrolled on one or more courses.
* A course may have one or more students enrolled.
* A course may be taught by one or more lecturers.

**(10 marks)**

**(Total 30 Marks)**

**PART B: Practical Tasks**

IMPORTANT!! Save your work REGULARLY

**Q. 4 DATABASE IMPLEMENTATION – videostore (PRACTICAL IMPLEMENTATION)**

Given the following Relational Notation description of a database called ‘videostore’. Implement the database using MySQL.

videostore={customer, rental, rentaldetails,item, itemtype, rentalrates}

customer ={ **CUSTID** , FIRSTNAME, LASTNAME, ADDRESS}

Where

* CUSTID is data type ‘varchar(10)’

rental={ **RENTALNR** , **CUSTOMERID**, DATEOUT, DATEDUE }

Where

* RENTALNR is data type ‘varchar(10)’
* DATEOUTand DATEDUE are datatype ‘datetime’
* CUSTOMERID is datatype ‘varchar(10)’
* CUSTOMERID is a FK referencing CUSTID in the ‘customer’ table

rentaldetails={ **RENTAL** , ITEMNR }

Where

* RENTAL and ITEMNR are data type ‘varchar(10)’
* RENTAL is a FK referencing RENTALNR in the RENTAL table
* ITEMNR is a FK referencing ITEMCODE in the ITEM table

item={ **ITEMCODE**, TYPE, TITLE, PRICECODE, QTYINSTOCK}

Where

* ITEMCODE, TYPE and PRICECODE are data type ‘varchar(10)’
* QTYINSTOCK is data type ‘smallint’
* TYPE is a FK referencing TYPECODE in the ITEMTYPE table
* TYPE is data type ‘varchar(10)’
* PRICECODE is a FK referencing RATECODE in the ‘rentralrates’ table

itemtype={ **TYPECODE** , TYPEDESCRIPTION}

Where

* TYPECODE is data type ‘varchar(10)’

rentalrates ={ **RATECODE** , RATEDESCRIPTION, PRICE}

Where

* RATECODE is data type ‘varchar(10)’
* PRICE is data type ‘decimal(3,2)’

Notes:

* All data types are ‘varchar(45)’ unless otherwise stated

DELIVERABLE:Perform a BACKUP of this database (only this one) in MySQL and save the backup file in the Q4 Folder in your Exam Drive.

**(Total 30 Marks)**

**Q. 5 DATABASE WEB APPLICATION - PHP DEBUG**

Note: Question 4 must be completed before attempting this question.

Instructions:

1. Locate the web application customer.php in the Q5/SOURCEFILES folder on your exam drive.

2. Copy the file ‘customer.php’ and ‘connection.php’ to an appropriate your Apache Web Server

3. This application is designed to view the data in the customer table in the ‘videostore’ database that you have set up in Q4

a) Using MySQL Administrator or Workbench – enter the following data into the customer table:

|  |  |  |  |
| --- | --- | --- | --- |
| **CustID** | FirstName | LastName | Address |
| 1 | James | Murphy | Limerick |
| 2 | Mary | O'Brien | Cork |
| 3 | Michael | Jones | Galway |

**(3 marks)**

b) This web application you have downloaded contains errors or is incomplete and does not work correctly. You will need to make changes in order to get it to work.

Notes:

* Do not edit/make changes to the ‘connection.php’ file.
* Make whatever changes are necessary to ‘customer.php’. Note that there are no syntax errors.
* Read the PHP comments in both PHP files for further instructions.

Run the application to display the customer table data.

DELIVERABLES:

1. Save your corrected code (‘connection.php’ and ‘customer.php’)in the Q5/ANSWERFILES folder on your exam drive.
2. Take a screenshot of the working application. Save the screenshot in a WORD document. Save the WORD document in the Q5/ANSWERFILES folder.

**(17 marks)**

**(Total 20 Marks)**